3627760 2268307

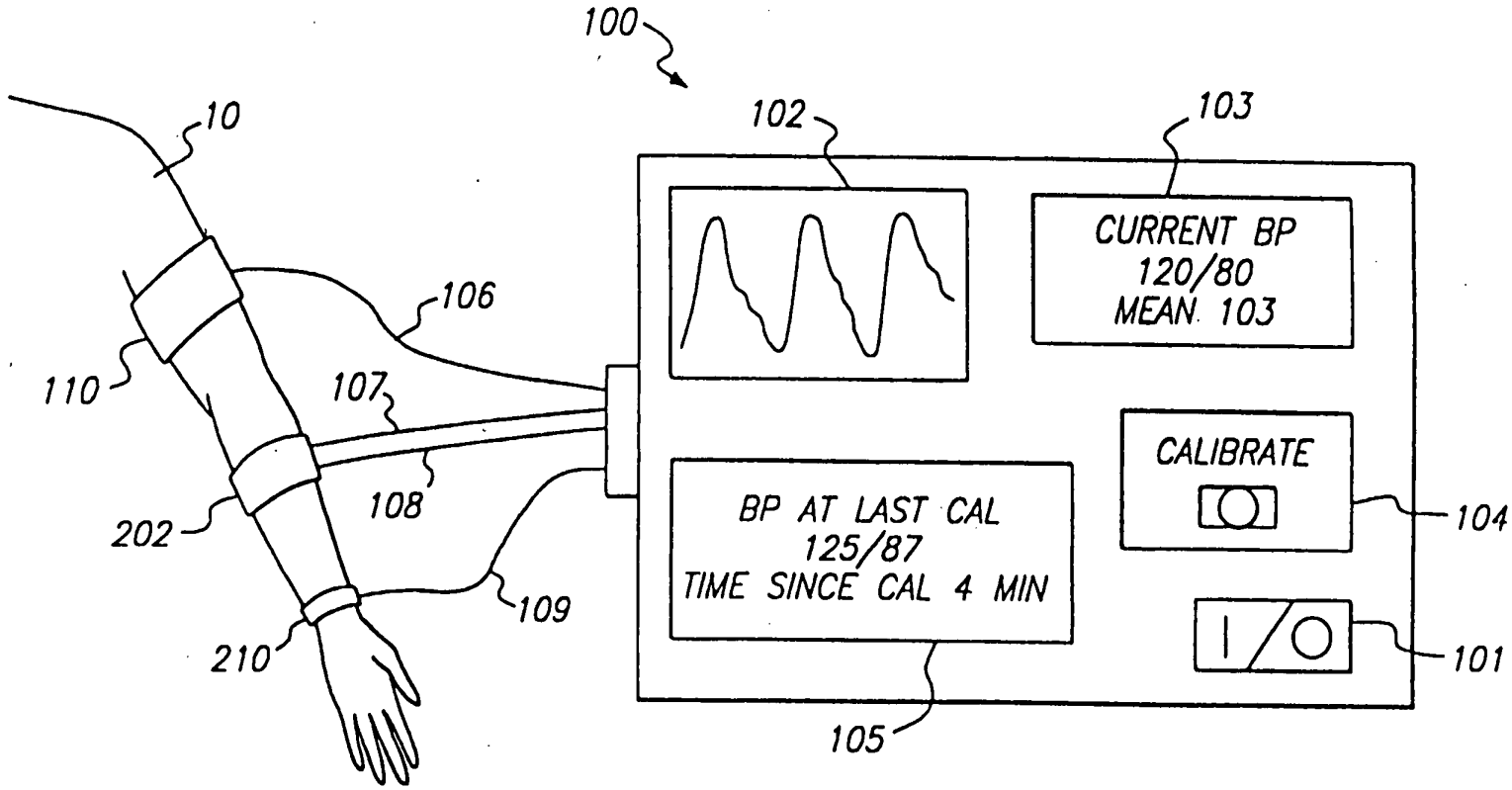

FIG. 1

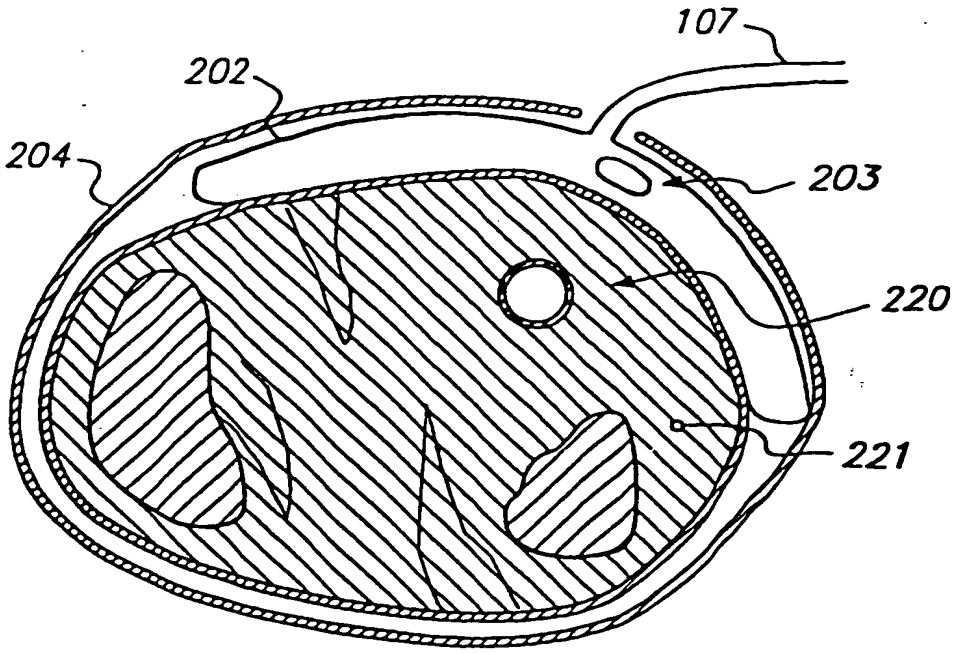

FIG. 2

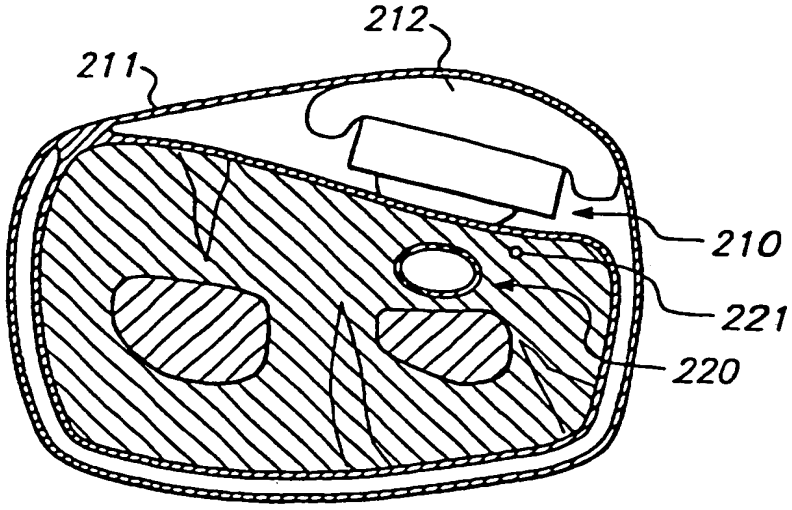

FIG. 3

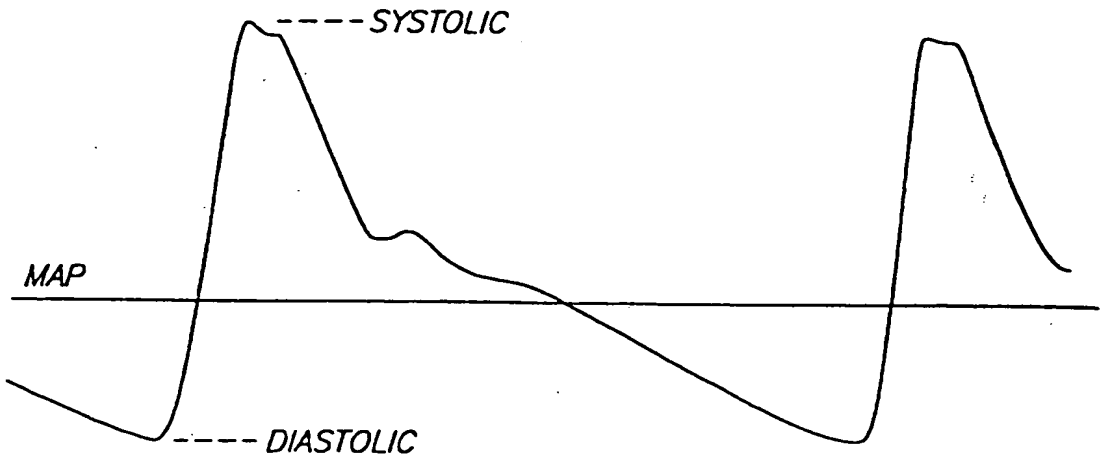

FIG. 4a

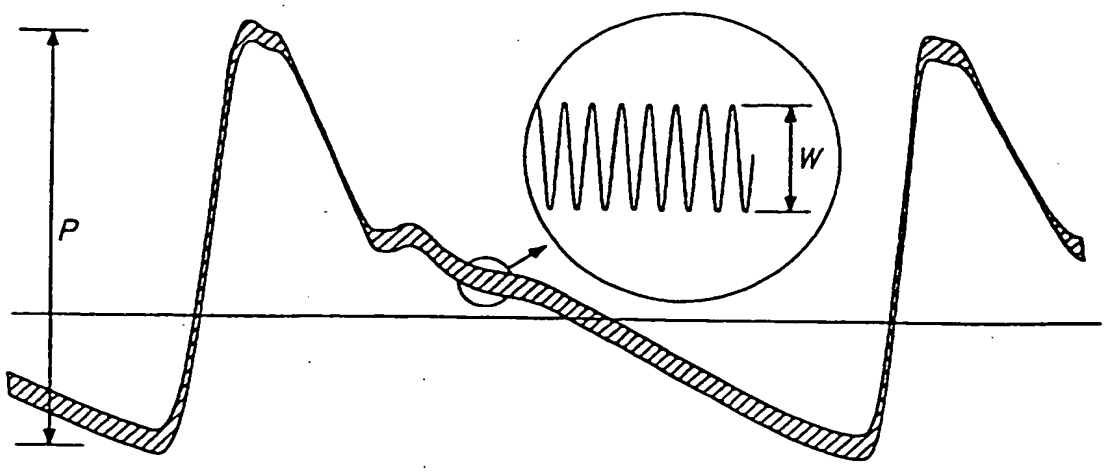

FIG. 4b

2027-0-22625007

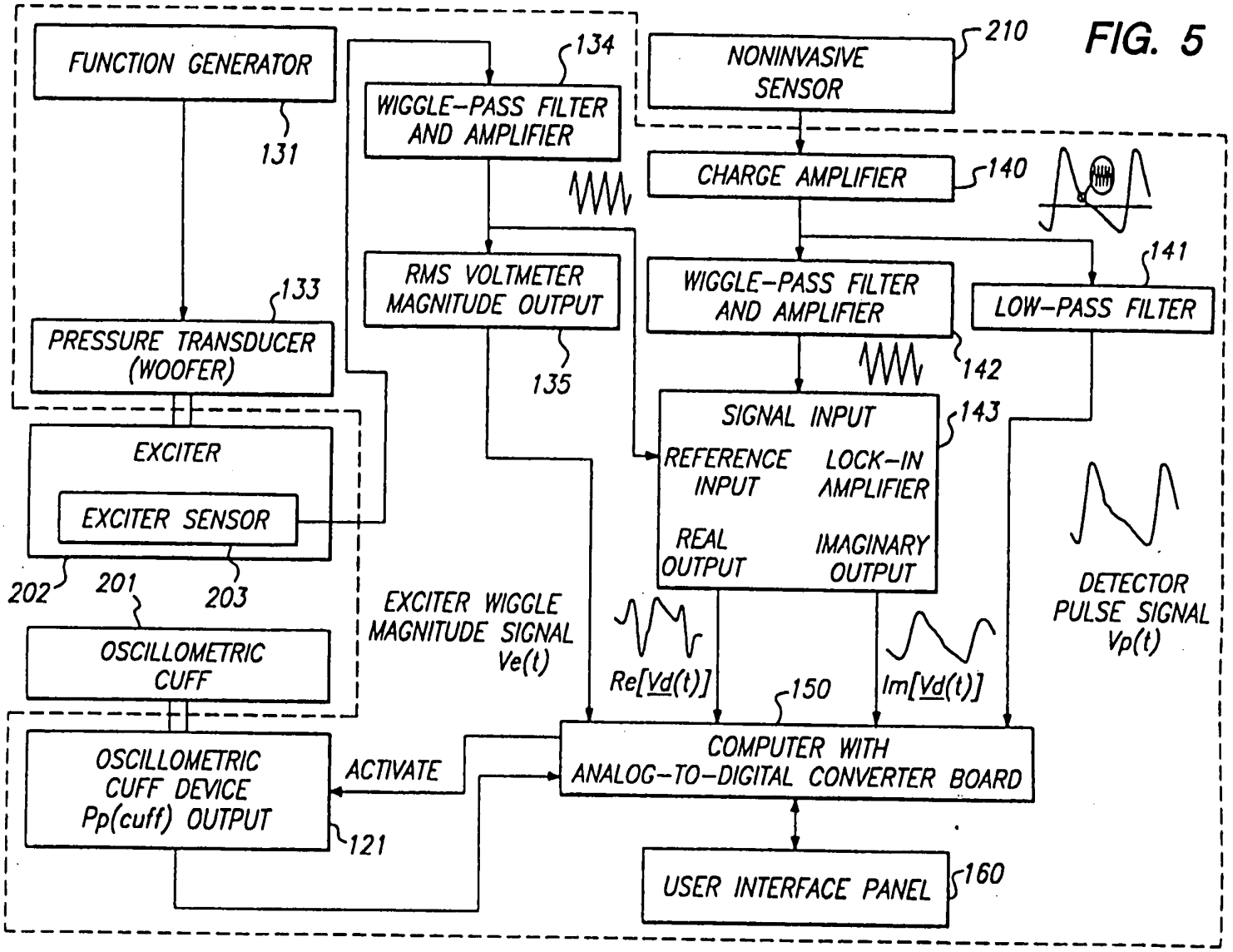

FIG. 5

FIG. 6a

FIG. 6b

FIG. 6

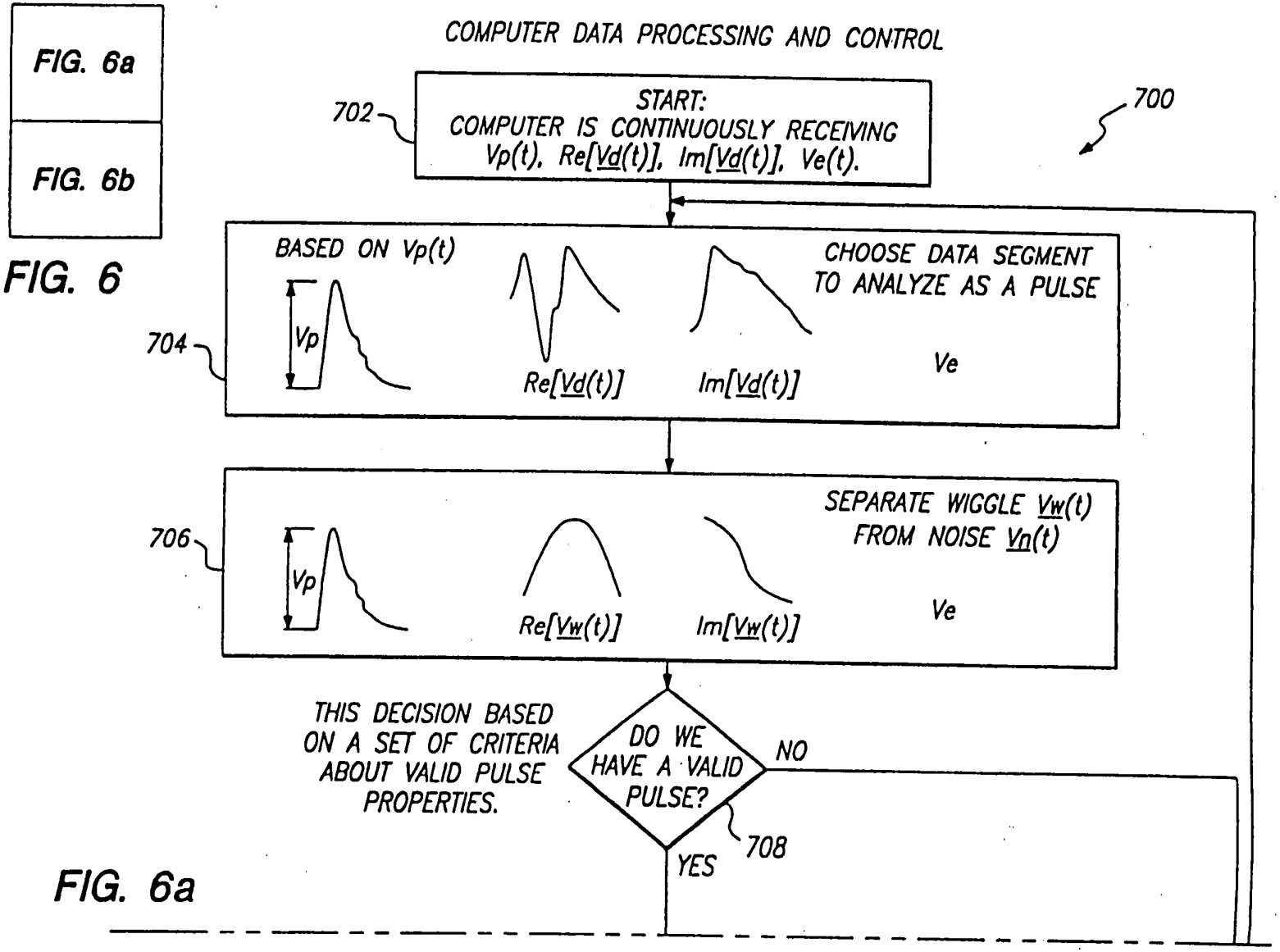

FIG. 6a

20210 226306

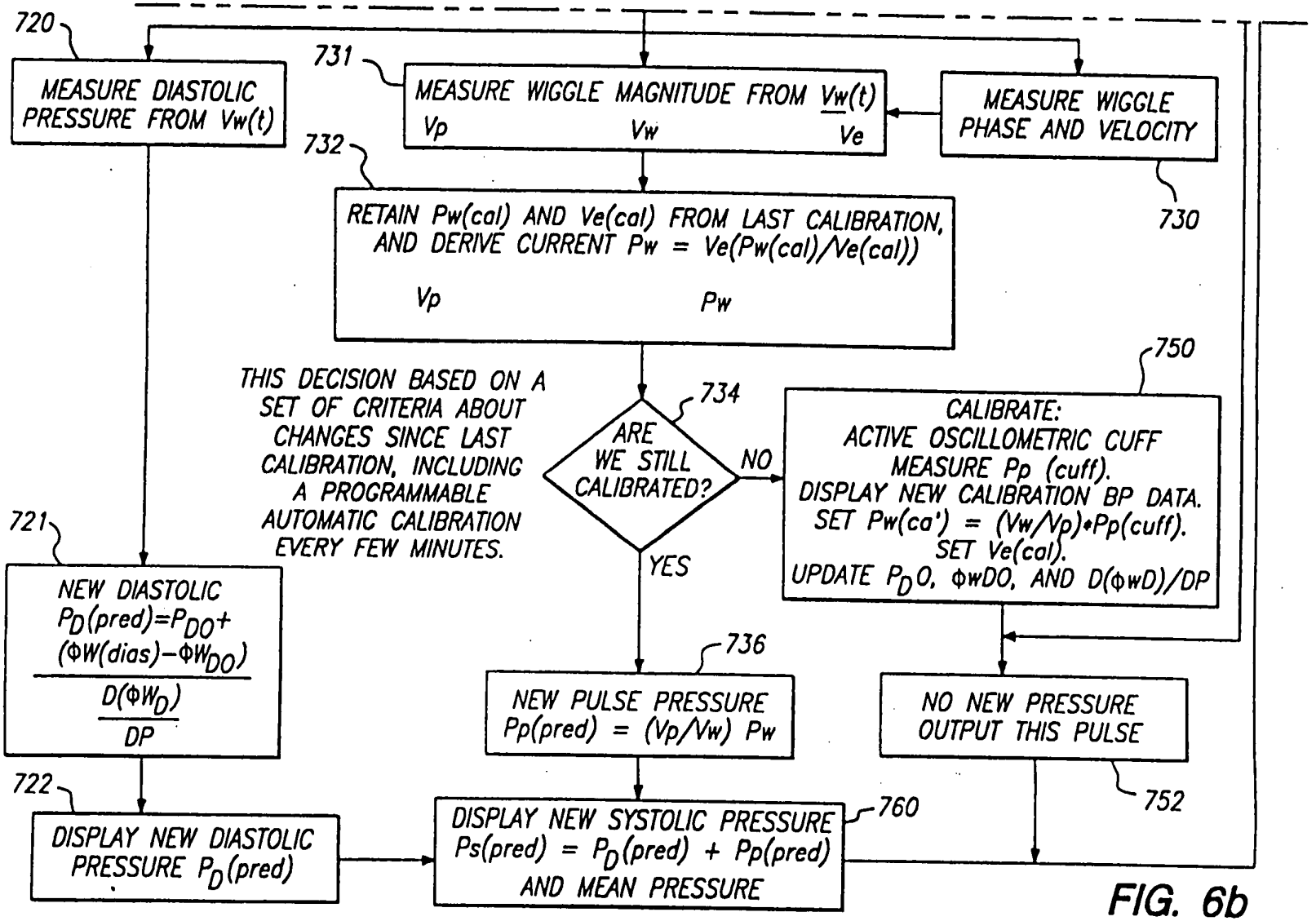

FIG. 6b

EP 0 744 150 A2

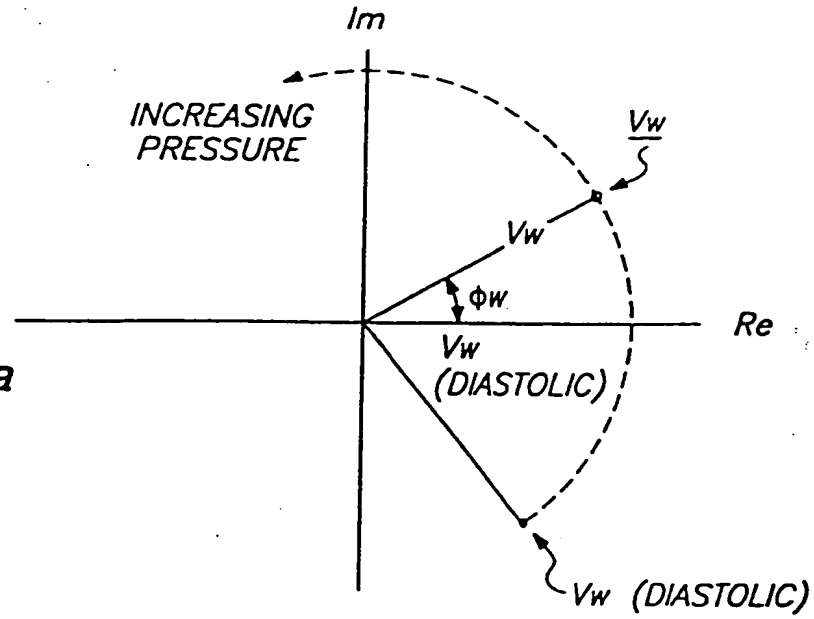

FIG. 7a

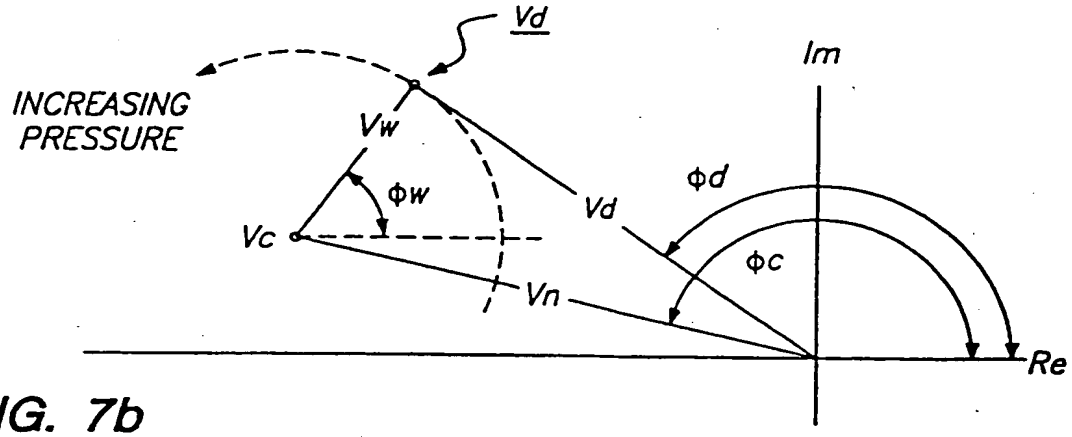

FIG. 7b

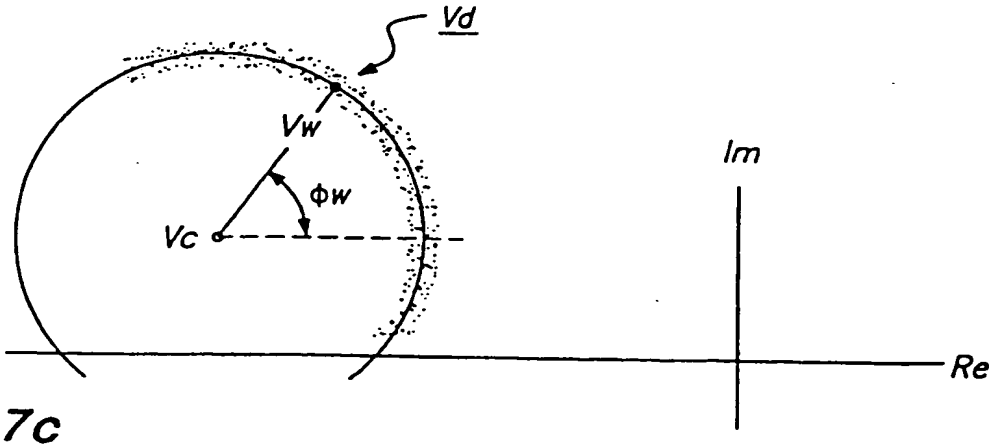

FIG. 7c

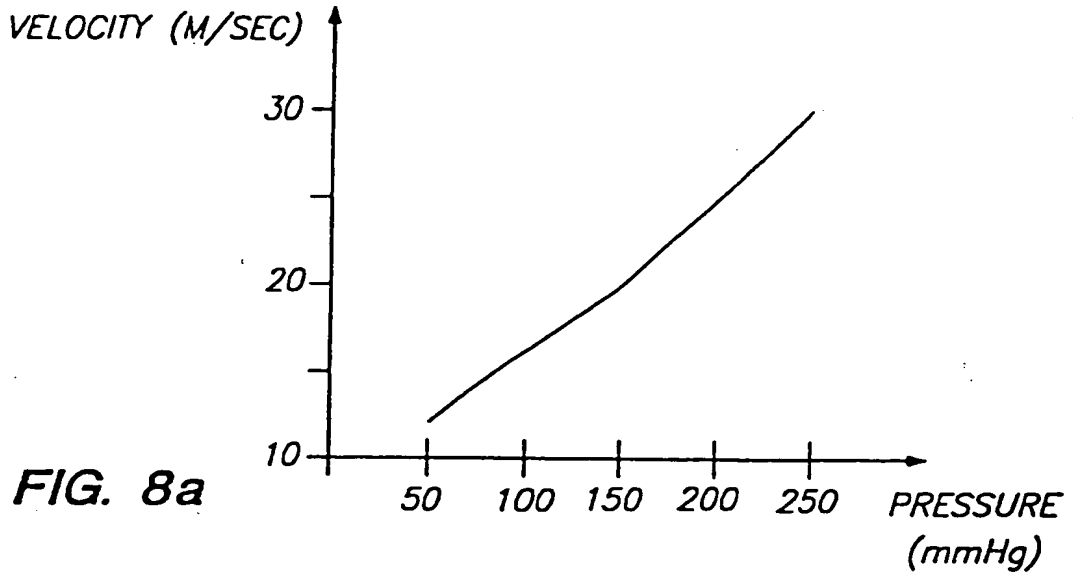

FIG. 8a

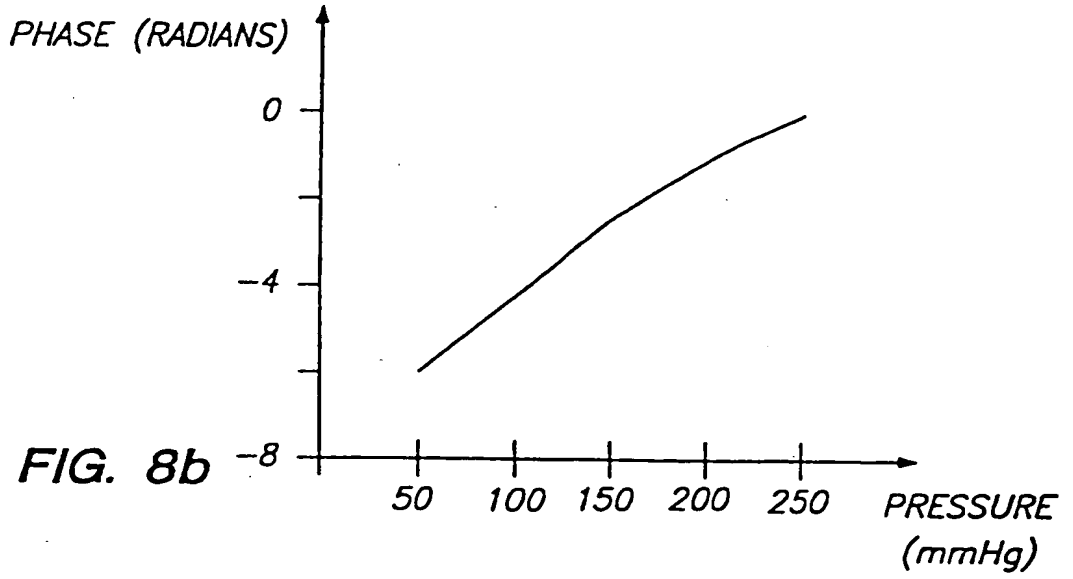

FIG. 8b

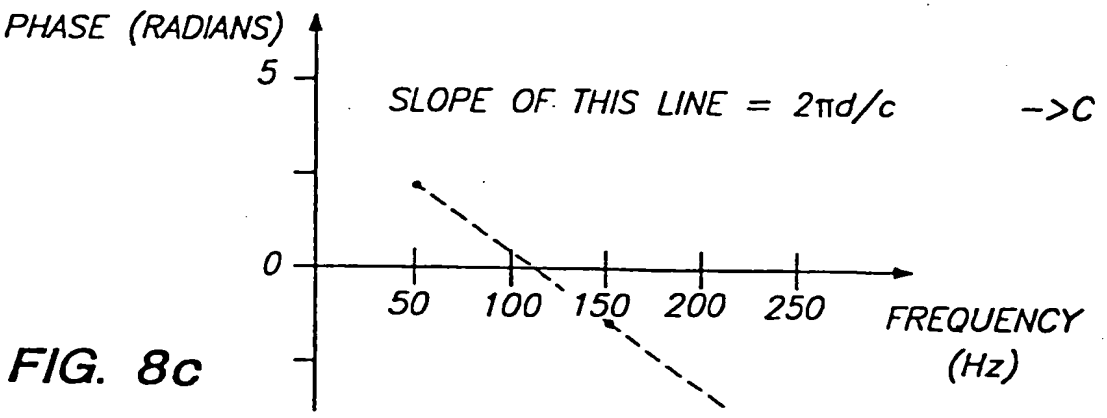

FIG. 8c

FIG. 9a

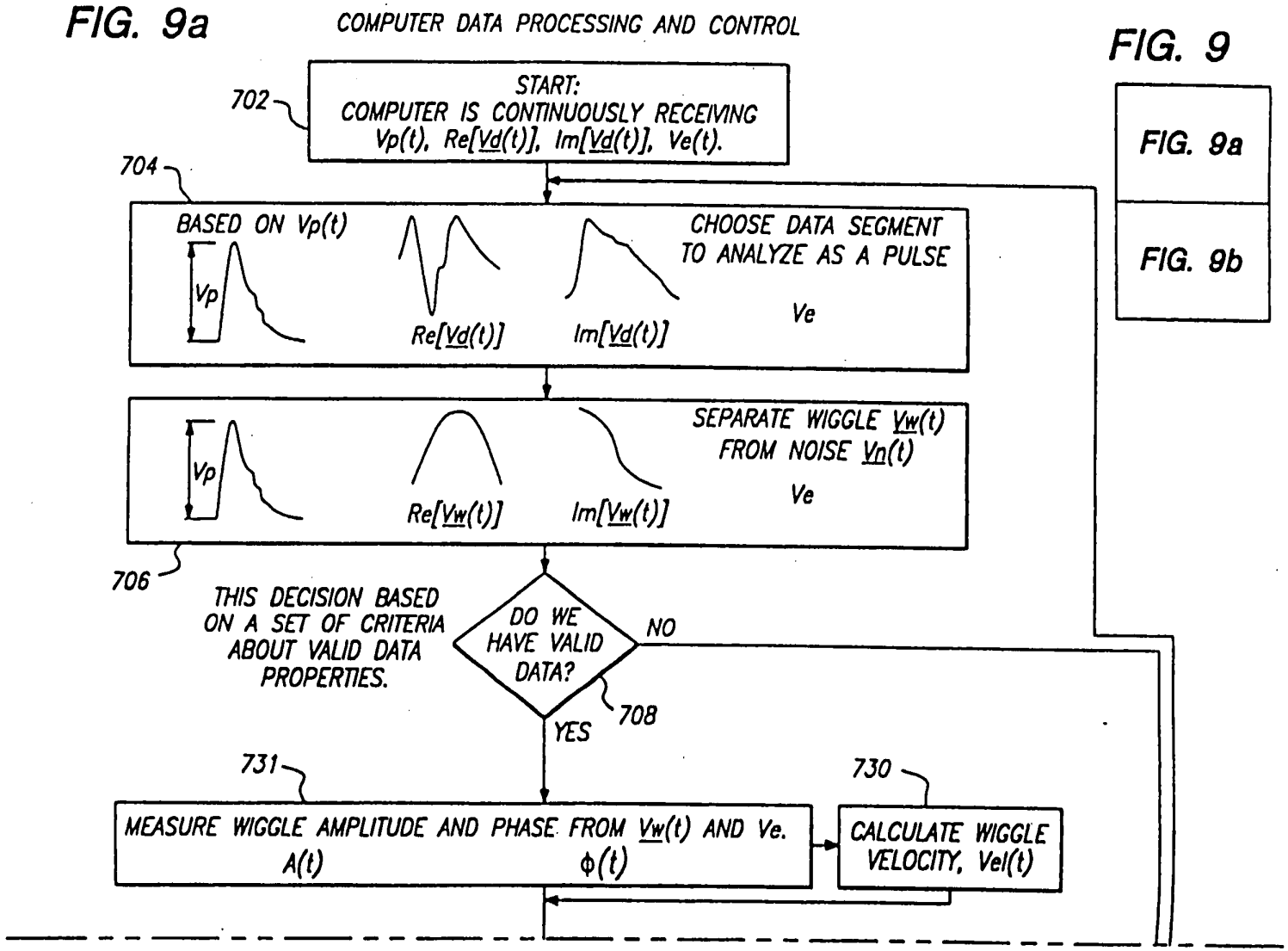
COMPUTER DATA PROCESSING AND CONTROL
702
START:
COMPUTER IS CONTINUOUSLY RECEIVING
Vp(t), Re[Vd(t)], Im[Vd(t)], Ve(t).
704
BASED ON Vp(t)
Vp
Re[Vd(t)]
Im[Vd(t)]
CHOOSE DATA SEGMENT
TO ANALYZE AS A PULSE
Ve
Vp
Re[Vw(t)]
Im[Vw(t)]
SEPARATE WIGGLE Vw(t)
FROM NOISE Vn(t)
Ve
706
THIS DECISION BASED
ON A SET OF CRITERIA
ABOUT VALID DATA
PROPERTIES.
DO WE
HAVE VALID
DATA?
708
NO
YES
731
MEASURE WIGGLE AMPLITUDE AND PHASE FROM Vw(t) AND Ve.
A(t)
ϕ(t)
730
CALCULATE WIGGLE
VELOCITY, Vel(t)

FIG. 9

FIG. 9a
FIG. 9b

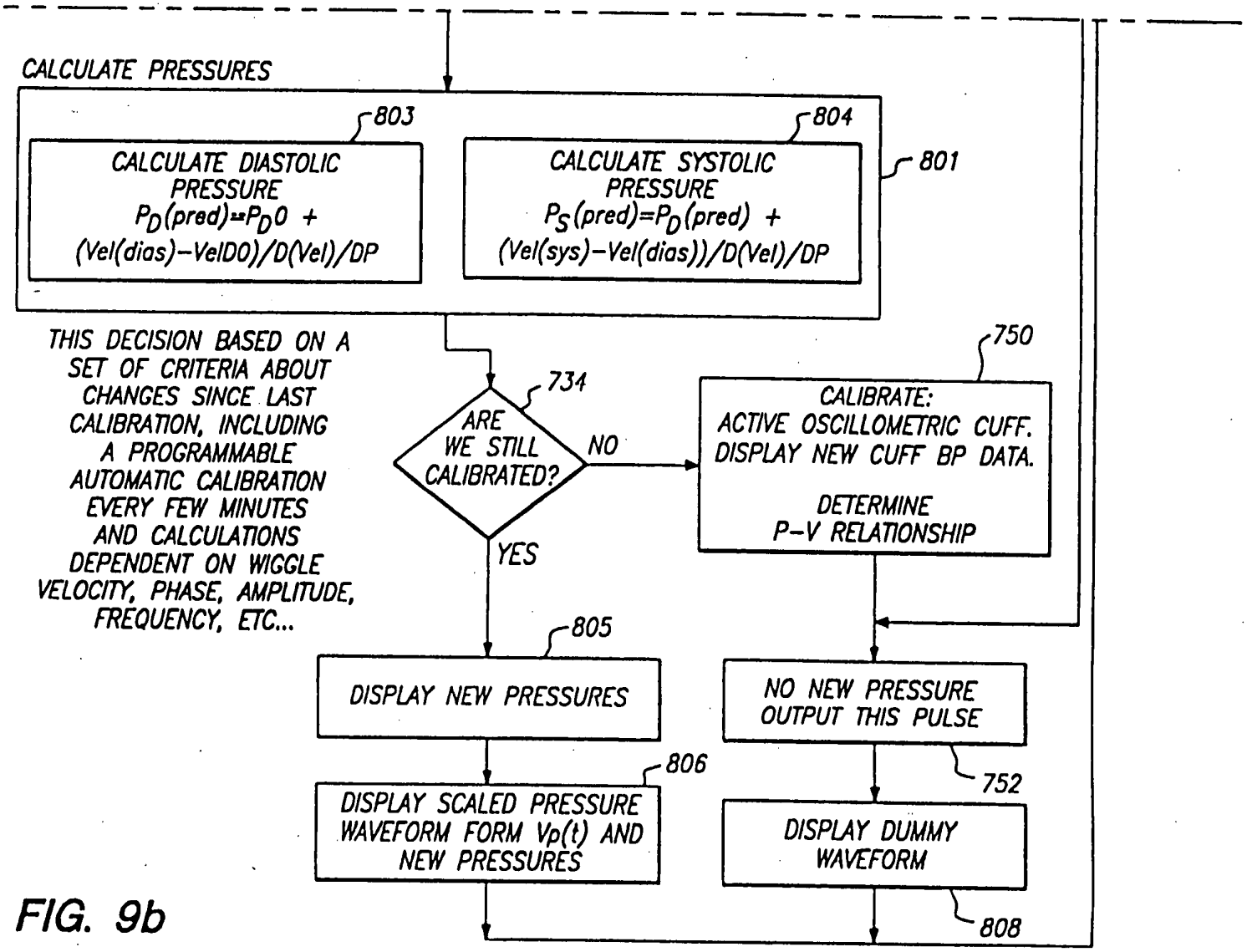
CALCULATE PRESSURES
803
CALCULATE DIASTOLIC PRESSURE
$P_D(pred)=P_D0$ +
(Vel(dias)−VelD0)/D(Vel)/DP
804
CALCULATE SYSTOLIC PRESSURE
$P_S(pred)=P_D(pred)$ +
(Vel(sys)−Vel(dias))/D(Vel)/DP
801
THIS DECISION BASED ON A SET OF CRITERIA ABOUT CHANGES SINCE LAST CALIBRATION, INCLUDING A PROGRAMMABLE AUTOMATIC CALIBRATION EVERY FEW MINUTES AND CALCULATIONS DEPENDENT ON WIGGLE VELOCITY, PHASE, AMPLITUDE, FREQUENCY, ETC...
734
ARE WE STILL CALIBRATED?
NO
YES
750
CALIBRATE:
ACTIVE OSCILLOMETRIC CUFF.
DISPLAY NEW CUFF BP DATA.
DETERMINE
P–V RELATIONSHIP
805
DISPLAY NEW PRESSURES
806
DISPLAY SCALED PRESSURE WAVEFORM FORM Vp(t) AND NEW PRESSURES
NO NEW PRESSURE OUTPUT THIS PULSE
752
DISPLAY DUMMY WAVEFORM
808

FIG. 9b

20270 22630AT

FIG. 10a

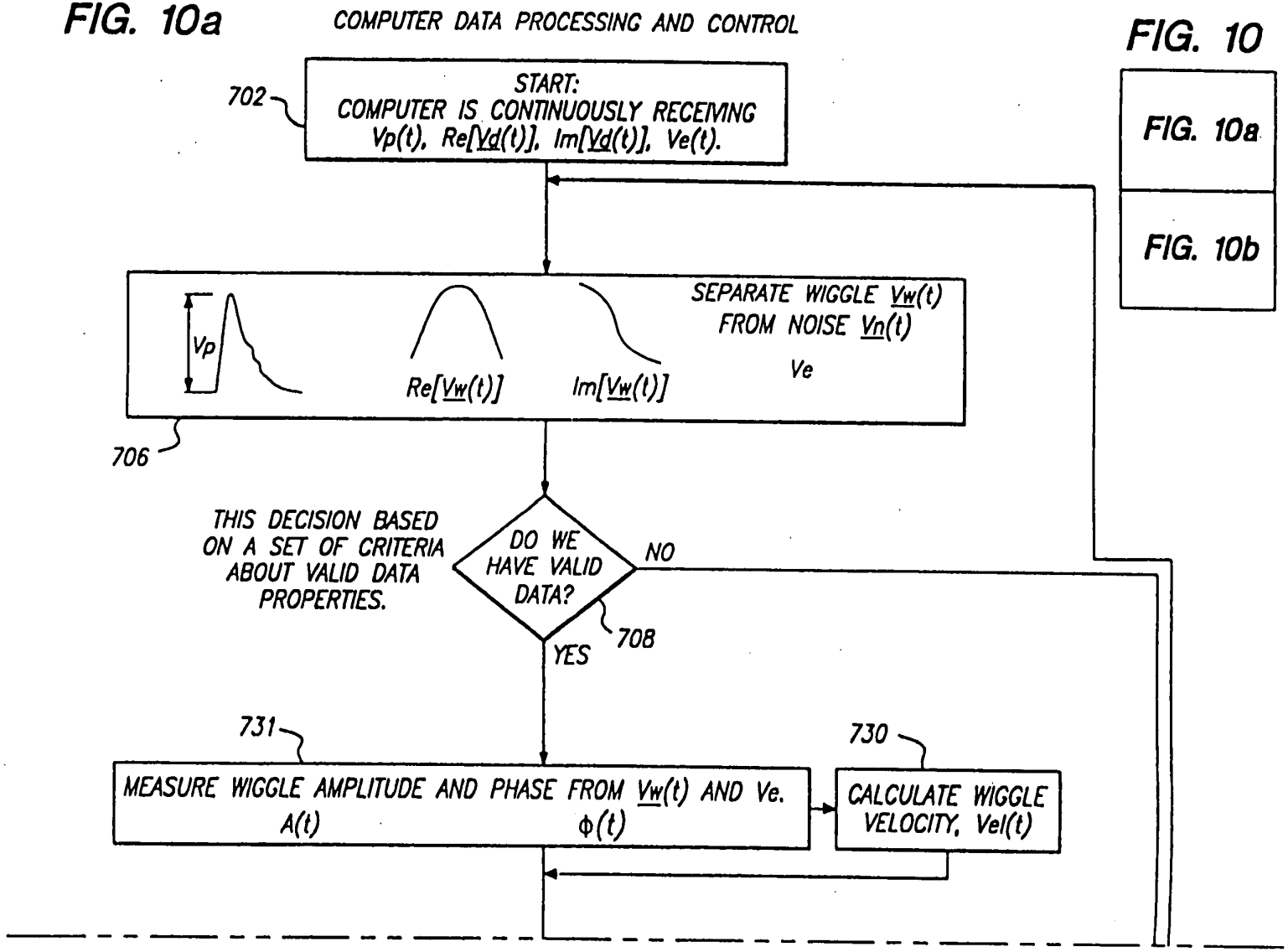

FIG. 10

FIG. 10a

FIG. 10b

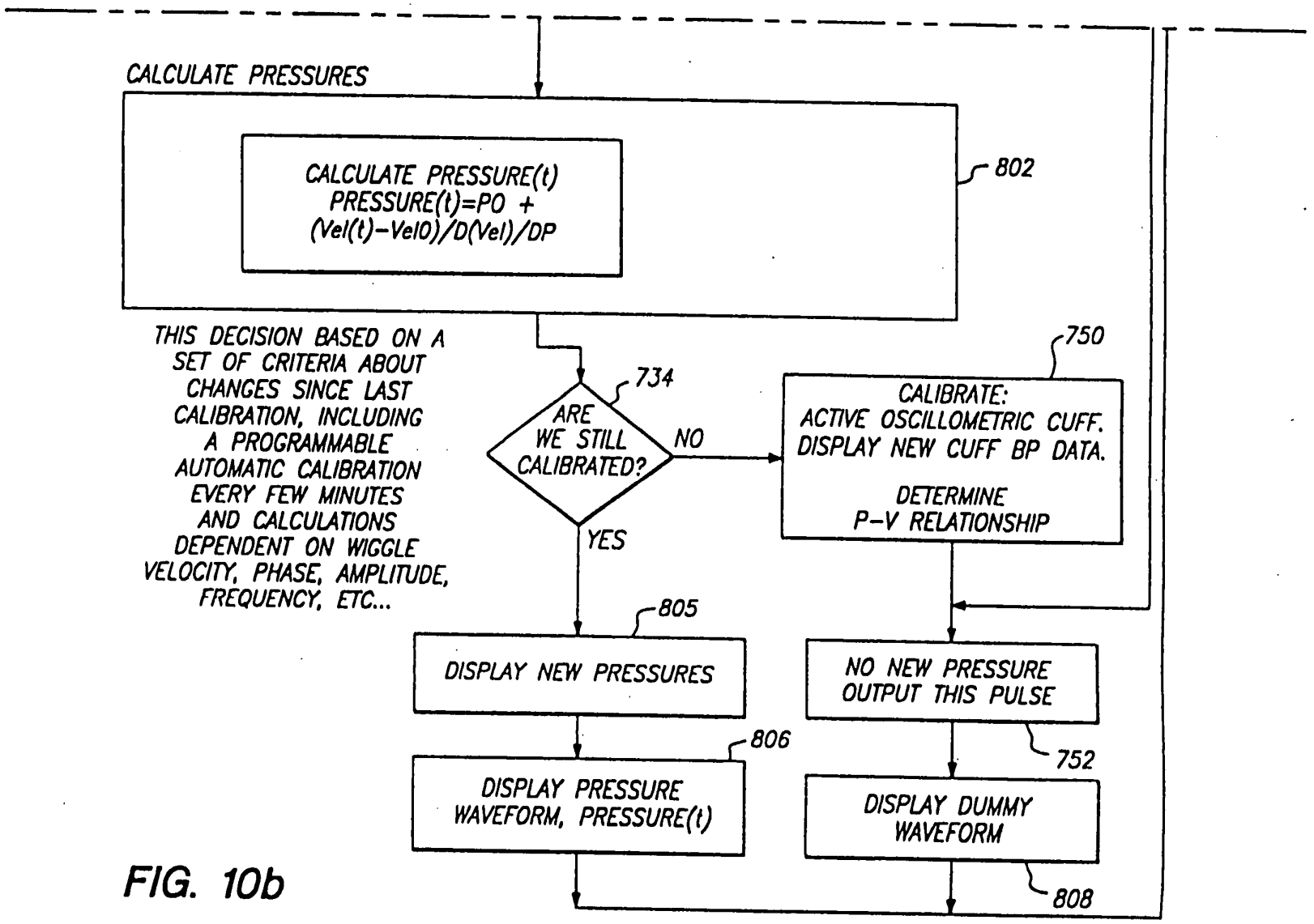
CALCULATE PRESSURES
CALCULATE PRESSURE(t)
PRESSURE(t)=PO +
(Vel(t)-Vel0)/D(Vel)/DP
802
THIS DECISION BASED ON A SET OF CRITERIA ABOUT CHANGES SINCE LAST CALIBRATION, INCLUDING A PROGRAMMABLE AUTOMATIC CALIBRATION EVERY FEW MINUTES AND CALCULATIONS DEPENDENT ON WIGGLE VELOCITY, PHASE, AMPLITUDE, FREQUENCY, ETC...
734
ARE WE STILL CALIBRATED?
NO
YES
750
CALIBRATE: ACTIVE OSCILLOMETRIC CUFF. DISPLAY NEW CUFF BP DATA.
DETERMINE P-V RELATIONSHIP
805
DISPLAY NEW PRESSURES
806
DISPLAY PRESSURE WAVEFORM, PRESSURE(t)
NO NEW PRESSURE OUTPUT THIS PULSE
752
DISPLAY DUMMY WAVEFORM
808

FIG. 10b

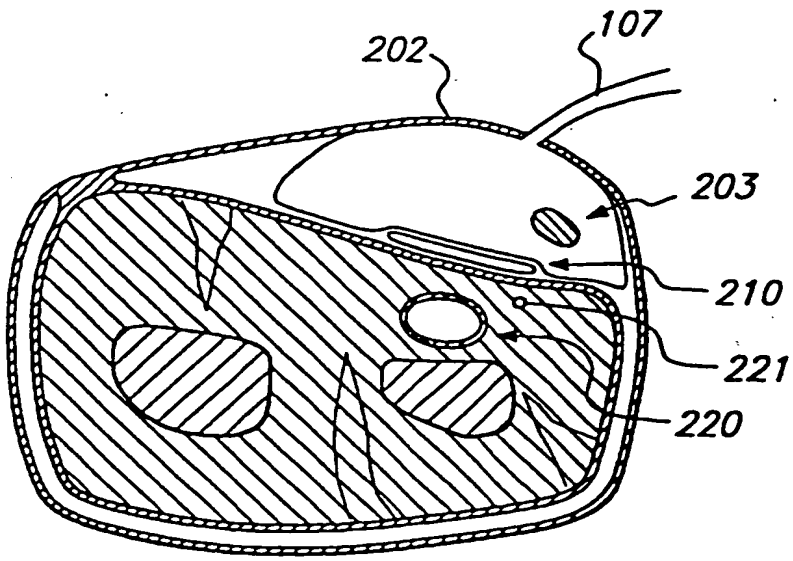

FIG. 11

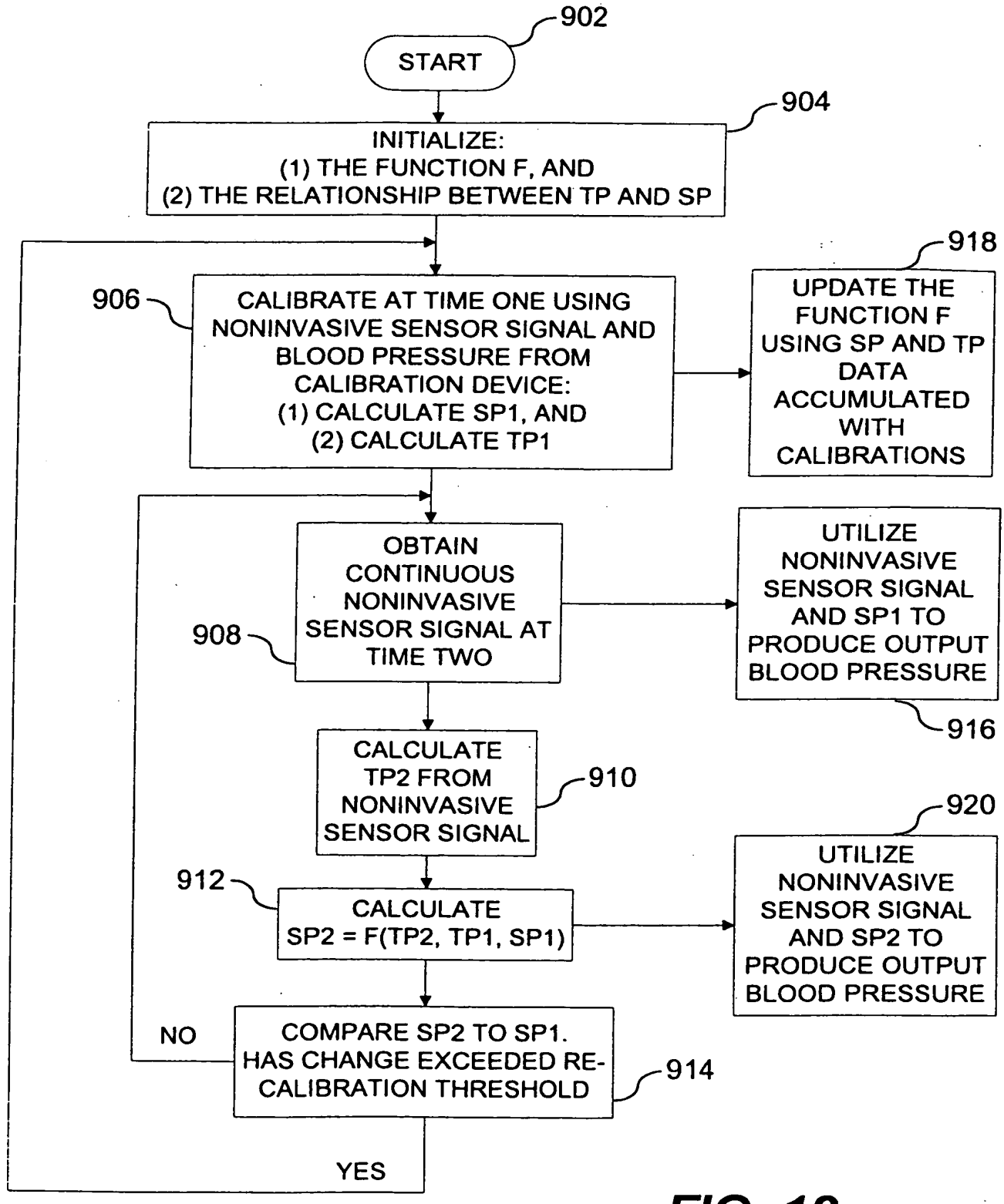
902
START
904
INITIALIZE:
(1) THE FUNCTION F, AND
(2) THE RELATIONSHIP BETWEEN TP AND SP
906
CALIBRATE AT TIME ONE USING NONINVASIVE SENSOR SIGNAL AND BLOOD PRESSURE FROM CALIBRATION DEVICE:
(1) CALCULATE SP1, AND
(2) CALCULATE TP1
918
UPDATE THE FUNCTION F USING SP AND TP DATA ACCUMULATED WITH CALIBRATIONS
908
OBTAIN CONTINUOUS NONINVASIVE SENSOR SIGNAL AT TIME TWO
UTILIZE NONINVASIVE SENSOR SIGNAL AND SP1 TO PRODUCE OUTPUT BLOOD PRESSURE
916
910
CALCULATE TP2 FROM NONINVASIVE SENSOR SIGNAL
920
912
CALCULATE SP2 = F(TP2, TP1, SP1)
UTILIZE NONINVASIVE SENSOR SIGNAL AND SP2 TO PRODUCE OUTPUT BLOOD PRESSURE
NO
COMPARE SP2 TO SP1. HAS CHANGE EXCEEDED RE-CALIBRATION THRESHOLD
914
YES

FIG. 12